



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,101	02/01/2005	Liliana Bagala' Rampazzo	09931-00035-US	8413

23416 7590 02/06/2008
CONNOLLY BOVE LODGE & HUTZ, LLP
P O BOX 2207
WILMINGTON, DE 19899

EXAMINER

NELSON, MICHAEL E

ART UNIT	PAPER NUMBER
----------	--------------

1794

MAIL DATE	DELIVERY MODE
-----------	---------------

02/06/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/523,101	Applicant(s) BAGALA' RAMPAZZO ET AL.	
	Examiner MICHAEL E. NELSON	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/18/2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21, 25, 26, 28 and 29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21, 25-26 and 28-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. Claims 1-21, 25-26, and 28-29 are pending. Claims 1 and 18 are amended.

Claim Objections

2. Claims 13, 16 and 17 are objected to because of the following informalities:
3. In claim 13, the claim reads "according to claim 1 wherein L=N=H, K and M in position 2 and 2' are A-C=O." In the structure of claim 1, M is in the 7' position, while N is in the 2' position.
4. In claim 16, the claim reads "according to claim 1 wherein L=N=H, K and M in position 2 and 2' are A-C=O." In the structure of claim 1, M is in the 7' position, while N is in the 2' position.
5. In claim 17, the claim reads "according to claim 1 wherein L=M=H, K and N in position 2 and 7' are A-C=O." In the structure of claim 1, N is in the 2' position, while M is in the 7' position.
6. Appropriate correction is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1794

8. Claims 1-21, 26, 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lupo et al. (5,840,217) with evidence supplied by Towle (4,898,983).

9. Concerning claims 1-17, Lupo et al. describe the synthesis and preparation of 9,9'-spirobifluorene compounds for use in electroluminescent devices. Lupo et al. specifically detail the synthesis of acetyl derivatives of 9,9'-spirobifluorene, particularly 2,2'-diacetyl-9,9'-spirobifluorene based on electrophilic acylation of 9,9'-spirobifluorene (column 27, Lines 5-22). Lupo et al. further details that the 2,2',7'-triacetyl-9,9'-spirobifluorene and 2,2',7,7'-tetraacetyl-9,9'-spirobifluorene are synthesizable by control of the stoichiometry of the reaction. Though Lupo et al. do not specifically mention formation of the 2-acetyl-9,9'-spirobifluorene, based on the control of the stoichiometry proposed by Lupo et al., it would also have been obvious to one of ordinary skill to reduce the amount of acetyl chloride in the reaction to produce the mono-substituted 9,9'-spirobifluorene.

10. Based on the synthetic method described by Lupo et al., it would have been obvious to one of ordinary skill in the art to substitute well-known aryl chlorides instead of acetyl chloride in the electrophilic acylation reaction to produce aryl substituted 9,9'-spirobifluorene analogs. For example, Towle (4,898,983) describes the use of electrophilic acylation reactions for forming aryl carbonyl compounds, and specifically mention the use of acetyl chloride, or aryl chlorides such as 4-fluorobenzoyl chloride, and 4-hydroxybenzoyl chloride (column 4, lines 3-8).

Art Unit: 1794

11. Since Lupo et al. utilize the 9,9'-spirobifluorene compounds in an electroluminescent device, the compounds are known to be electrically conducting. In such a device, electrons are injected into the material, by definition producing the radical anion of the material. As such, the radical anions of the compounds are an obvious variant of the compounds themselves, since they are used as materials in electrical devices.

12. Concerning claim 18-19, Lupo et al. describe the synthesis of mono, di, tri, and tetra substituted compounds as discussed above. Lupo et al. does not specifically mention the separation of enantiomers after synthesis, so the compounds would be present as a mixture of enantiomers. However, resolution of enantiomeric mixtures is well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art to resolve the enantiomeric mixture into optically pure enantiomers using standard techniques, including chiral HPLC, or chiral derivatization.

13. Concerning claim 20, Lupo et al. describe the method used to synthesize the 9,9'-spirobifluorene compounds by reacting an the unsubstituted 9,9'-spirobifluorene with acetyl chloride in the presence of AlCl_3 (Lewis Acid) in CS_2 as solvent, at reflux temperature.

14. Concerning claim 21, Lupo et al. describe the acyl-chloride functionalized 9,9'-spirobifluorene compound (column 32, lines 31-40). The formation of aromatic carbonyl compounds by the reaction of acyl halides with aromatic compounds in the presence of Lewis acids is a well known process (as evidenced by Towle), it would have been

Art Unit: 1794

obvious to one of ordinary skill in the art to synthesize the aroyl substituted 9,9'-spirobifluorene compounds by electrophilic acylation of an aromatic compound by an acyl halide functionalized 9,9'-spirobifluorene compound.

15. Concerning claim 26 and 28, Lupo et al. describe the use of 9,9'-spirobifluorene compounds in electroluminescent devices. While the specific acetyl substituted compounds are not specifically used by Lupo et al. in the electroluminescent device, Lupo et al. describe the utility of many 9,9'-spirobifluorene compounds, including unsubstituted 9,9'-spirobifluorene compounds, as materials for electroluminescent devices. Based on the general teaching by Lupo, et al. it would have been obvious to one of ordinary skill in the art to test the aroyl-functionalized 9,9'-spirobifluorene compounds as materials for electroluminescent devices.

16. Concerning claim 29, Lupo et al. describe the synthesis of the multi-acetyl substituted 9,9'-spirobifluorene compounds, as discussed above. Lupo et al. also describe the conversion of those multi-acetyl substituted compounds into multi-carboxyl substituted compounds, (column 27, lines 27-41). Lupo, et al. also disclose the conversion of the di-carboxyl-9,9'-spirobifluorene compounds into the di-acylchloride substituted 9,9'-spirobifluorene. (Column 32, lines 31-40) Based on the method described by Lupo et al. it would have been obvious to use the same conditions to convert the known multi-carboxyl substituted compounds into the multi-acylchloride substituted compounds.

Art Unit: 1794

17. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lupo et al. as applied to claim 1-21, 26, 28-29 above, and further in view of Pedersen et al.

(Journal of Electroanalytical Chemistry, vol. 454, pp. 123-143, 1998).

18. Concerning claim 25, Lupo et al. describe the acyl substituted 9,9'-spirobifluorene compounds as discussed above, but are silent on the method of production of the radical anion of the compounds.

19. Pedersen et al. describe the production and measurement of radical anions of several aromatic compounds, and describe the method as electrochemically generating, by supplying an electrical potential, a radical anion of a 2-6 mM solution of aromatic compound in a solution of 0.1M TBABF₄ (tetrabutylammonium tetrafluoroborate, a supporting electrolyte) in DMF (page 125). The solution of TBABF₄ in DMF was dried (made anhydrous) prior to each experiment (page 124).

20. It would have been obvious to one of ordinary skill in the art to use a general method for preparing and measuring radical anions as described by Pedersen et al. on compounds as described by Lupo et al. for the purpose of measuring and analyzing the radical anions formed in an electronic device.

Response to Arguments

16. Objections to the specification have been withdrawn in light of Applicant's amendments.

17. The objection to claim 18 has been withdrawn in light of Applicant's amendment.

18. The rejection of claims 1-5 under 35 U.S.C. 112 first paragraph, scope of enablement, has been withdrawn in light of Applicant's amendments.

19. It is noted that "the arguments of counsel cannot take the place of evidence in the record", *In re Schulze*, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965). It is the examiner's position that the arguments provided by the applicant regarding the unexpected results of benzoyl substituted spiro-bifluorene compounds compared with acetyl substituted spiro-bifluorene compounds must be supported by a declaration or affidavit. As set forth in MPEP 716.02(g), "the reason for requiring evidence in a declaration or affidavit form is to obtain the assurances that any statements or representations made are correct, as provided by 35 U.S.C. 24 and 18 U.S.C. 1001". An affidavit or declaration must be filed to support the showing of unexpected results.

20. Provided the comparative data in the arguments were supplied in a declaration or affidavit, claims 7, 13-14, and 16-17 would be allowable over the prior art in light of the showing of unexpected results. Claims which are fully dependent from allowable claims would also be allowable. As currently written, claims 1-6, 8-12, 15, 18-21, 25-26, and 28-29 would not be allowable, based on the evidence provided. The evidence showing unexpected results from a single compound is not sufficient to support the full scope of the claims as filed.

Conclusion

21. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 1794

22. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL E. NELSON whose telephone number is (571)270-3453. The examiner can normally be reached on M-F 7:30am-5:00pm EST (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on 571-272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1794

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michael E. Nelson
Examiner
Art Unit 1794

Callie Shusho

Callie Shusho
Supervising Patent Examiner